

**Vorticity, current helicity and alpha-effect for
magnetic-driven turbulence in the solar convection zone**

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The turbulent electromotive force as well as the kinetic and current helicities have been computed for a turbulence subject to magnetic buoyancy and global rotation. The field dynamo-alpha is found as positive in the northern hemisphere and negative in the southern hemisphere and the kinetic helicity has just the same signs.

In agreement with the observations the current helicity is found as negative in the northern hemisphere and as positive in the southern hemisphere. Our current helicities and alpha-effects are thus always out of phase. The signs of alpha-effect and both helicities exactly correspond to a recent numerical simulation by Brandenburg & Schmitt.

Also the turbulent angular momentum transport has been computed which proves to be always inwards. We can thus explain why in the supergranulation zone deeper layers appear to rotate faster than the solar surface plasma, or why in the solar tachocline at high-latitudes the angular velocity decreases outwards. The dynamo number derived from the observed current helicity reveals it as positive and rather small with massive consequences for the dynamo in the solar convection zone.